



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,443	02/07/2006	Yoshiaki Nagata	80658(47762)	5049
21874 7590 03/17/2010 EDWARDS ANGELL PALMER & DODGE LLP P.O. BOX 55874 BOSTON, MA 02205				
EXAMINER				
RIDER, LANCE W				
ART UNIT		PAPER NUMBER		
1618				
MAIL DATE		DELIVERY MODE		
03/17/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/567,443

Applicant(s)

NAGATA ET AL.

Examiner

LANCE RIDER

Art Unit

1618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/22)
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date: _____

DETAILED ACTION

Status of the Application

The remarks and amendments filed on October 28th 2009 are acknowledged. Claim 1 was amended, claim 6 was canceled, and claim 9 was added.

Receipt and consideration of Applicants' amended claim set and remarks filed on September 30th 2009 is acknowledged. Rejections and objections not reiterated from previous office actions are hereby withdrawn. The following rejections or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

New Grounds of Rejection

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-5, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita, T. et al. (Rare Earths, 2002) in view of Alburger, J.R. (U.S. Patent 3,567,932).

Tomita teaches a complex of BINAPO Europium and hfa, illustrated in the structure below. (See figures 2, 3, 4, and table 1.)



Tomita teaches a BINAPO, europium, hfa complex in which all of the phenyl ring positions are hydrogen and the R₁ position of the diketone is a trifluoromethyl group. (See column 5, lines 14-69.)

Tomita, T. et al. (Rare Earths, 2002) does not teach the use of a diketone coordinating compound in which the R₂ position is a phenyl group.

Alburger teaches fluorescent metal-organic coordination compounds. The use of europium and a variety of diketones such as 4,4,4-trifluoro-1-phenyl-1,3-butanedione

are disclosed. (See column 5, line 36 and line 64.) 4,4,4-trifluoro-1-phenyl-1,3-butanedione is a diketone containing a trifluoromethyl group at its R_1 position and a phenyl group at the R_2 position. Alburger further teaches that such diketones can chelate a number of different metals other than europium, such as ytterbium. (See column 5, line 38.) Alburger also teaches using the beta-diketones in complex with lanthanoids for forming brightly fluorescent ultraviolet-responsive dyes useful in display elements (See column 6, lines 11-19, and the abstract.)

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to substitute 4,4,4-trifluoro-1-phenyl-1,3-butanedione for the diketone hfa in order to form a fluorescent compound useful in display elements. Alburger teaches that the use of diketones, such as 4,4,4-trifluoro-1-phenyl-1,3-butanedione are useful to form such highly fluorescent metal-organic dyes. The skilled artisan would have predicted that this substitution would have functioned for the following reasons. First, both the diketone hfa of Tomita and the diketone, 4,4,4-trifluoro-1-phenyl-1,3-butanedione taught by Alburger were known to be useful in the formation of fluorescent dye complexes with europium. Second, both compounds chelate europium in a similar fashion and share the same core structure providing for this function.

It would have also been obvious to one of ordinary skill in the art at the time of the invention to substitute the lanthanide ytterbium for the lanthanide europium in order to form a different colored dye complex. Such a substitution merely requires choosing from a finite number of identified, predictable solutions. Alburger teaches the use of only

27 possible metals in dye complexes containing diketones, 15 of those metal complexes being lanthanides. The skilled artisan would have predicted that such a substitution would have functioned as both Europium and Ytterbium are trivalent fluorescent metals having similar binding characteristics.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tomita, T. et al. (Rare Earths, 2002) and Alburger, J.R. (U.S. Patent 3,567,932), as applied to claims 1-5 and 9 above, and in further view of Gladiali, S., et al., (Tetrahedron Asymmetry, 1998) and Reid, J.C., et al., (JACS, 1950).

Tomita and Alburger disclose the chemical composition comprising the complex of BINAPO with beta diketones such as 4,4,4-trifluoro-1-phenyl-1,3-butanedione as discussed above.

Tomita and Alburger do not disclose that the optical purity of the molecules is 70% ee, 90% ee, or greater.

Gladiali teaches methods for making enantiopure BINAPO. (See the abstract, the methods on page 392, and figure 1.) Reid teaches methods for making and purifying the diketone 4,4,4-trifluoro-1-phenyl-1,3-butanedione. (See page 2949, paragraph 1-2.)

Pure materials are novel vis-à-vis less pure or impure materials because there is a difference between pure and impure materials. Therefore, the issue is whether claims to a pure material are unobvious over the prior art. In re Bergstrom, 427 F.2d 1394, 166 USPQ 256 (CCPA 1970). Purer forms of known products may be patentable, but the mere purity of a product, by itself, does not render the product unobvious. Ex parte

Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). Factors to be considered in determining whether a purified form of an old product is obvious over the prior art include whether the claimed chemical compound or composition has the same utility as closely related materials in the prior art, and whether the prior art suggests the particular form or structure of the claimed material or suitable methods of obtaining that form or structure. In re Cofer, 354 F.2d 664, 148 USPQ 268 (CCPA 1966)

In the particular case Tomita and Alburger teach the instantly claimed complexes and the complexes of the prior art have the same utility as the instantly claimed complexes, both being dyes. The prior art also suggests the particular form or structure of the claimed material and suitable methods of obtaining that form or structure. The utility of the compounds as dyes would remain intact regardless of the enantiomeric purity. Though their absorption of optically polarized light would be affected by their optical purity, this would also have been obvious to the skilled artisan at the time of the invention as it was common knowledge that chemical compounds with high enantiomeric purity have a preferred interaction with either left or right circularly polarized light.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the methods of purification and synthesis disclosed by Gladiali and Reid to make pure forms of the two compounds 4,4,4-trifluoro-1-phenyl-1,3-butanedione and BINAPO in order to form enantiopure complexes of these compounds. The use of the pure forms of these compounds would allow for greater optical rotation of the light

and provide increased circular polarization as was known in the art at the time of the invention for compounds with high optical purity.

Conclusion

No claims allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **LANCE RIDER** whose telephone number is (571)270-1337. The examiner can normally be reached on M-F 11-12 and 1-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Hartley can be reached on (571)272-0616. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LANCE RIDER/
Examiner, Art Unit 1618

/Eric E Silverman/
Primary Examiner, Art Unit 1618

Application/Control Number: 10/567,443
Art Unit: 1618

Page 8